Department of Energy

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JUN 0 6 2008

Mr. Bharat Mathur, Acting Regional Administrator
U.S. Environmental Protection Agency
Region 5
77 West Jackson Blvd., Mail Code: R19J
Chicago, IL 60604-3507

PPPO-03-173-08

Mr. Juan Reyer, Director
Radiation Protection Division
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460

Dear Mr. Mathur and Mr. Reyer:

NATIONAL EMISSIONS STANDARDS FOR HAZARDOUS AIR POLLUTANTS, RADIONUCLIDE EMISSIONS REPORT FOR CALENDAR YEAR 2007

Enclosed is a certified copy of the annual Radiological National Emissions Standards for Hazardous Air Pollutants (NESHAP) report submitted in accordance with 40 CFR 61.94 (Subpart H) for airborne emissions from the U.S. Department of Energy (DOE) Portsmouth Gaseous Diffusion Plant (PORTS) during calendar year (CY) 2007.

During 2007, the PORTS site had operations conducted by two separate entities. The DOE, in conjunction with its remediation contractor, performed environmental restoration and waste management activities, while the United States Enrichment Corporation (USEC) leased and maintained the enrichment facilities at PORTS (both the former gaseous diffusion process, which is in "cold shutdown" status, and the centrifuge enrichment facility). The enclosed certified report addresses the emissions from the DOE operations only; however, for informational purposes, it also includes the total dose value associated with both DOE and USEC operations conducted at PORTS. The total dose value was derived by adding the DOE calculated dose with the dose value supplied to DOE by USEC. USEC will be submitting a separate NESHAP report addressing the radionuclide emissions from USEC operations. The combined dose to the most exposed individual resulting from both DOE and USEC operations was conservatively calculated at 0.0051 millirem (mrem) for CY 2007, which is below the regulatory standard of 10 mrem per year.

If you have any questions, please contact Melda Rafferty of my staff at (740) 897-5521.

Sincerely,

William E. Murphie
Manager
Portsmouth/Paducah Project Office

Enclosure:
Radiological National Emissions Standards for Hazardous Air Pollutants

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Administrative Records

DOE/PPPO/03-0064&D1

Radiological National Emission Standards for Hazardous Air Pollutants (NESHAP) 2007 Annual Report for the Department of Energy Portsmouth Gaseous Diffusion Plant, Piketon, Ohio

This document is approved for public release
per review by:
Henry H. Thomas 5/21/08
PORTS Classification/Information Office Date

DOE/PPPO/03-0064&D1

Radiological National Emission Standards for Hazardous Air Pollutants (NESHAP) 2007 Annual Report for the Department of Energy Portsmouth Gaseous Diffusion Plant, Piketon, Ohio

Date Issued—June 2008

Prepared by
CDM, a Joint Venture
under subcontract LPP 05SC003
Document Control No.: 1205-01.01.05.16.01-02336

Prepared for the
U.S. Department of Energy
Portsmouth/Paducah Project Office

LATA/PARALLAX PORTSMOUTH, LLC
managing the
Environmental Remediation Activities at the
Portsmouth Gaseous Diffusion Plant
under contract DE-AC24-05OH20192
for the
U.S. DEPARTMENT OF ENERGY

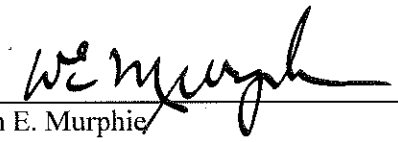
This certification pertains to the U.S. Department of Energy (DOE) activities at the Portsmouth site. It is DOE's understanding that the United States Enrichment Corporation (USEC) will be submitting a separate Radiological National Emission Standards for Hazardous Air Pollutants (NESHAP) 2007 Annual Report and certification pertaining to its activities at the Portsmouth site.

CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein and based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment. See, 18 U.S.C. 1001.

Paul Kreitz
Project Manager
LATA/Parallax Portsmouth, LLC (Operator)

5/29/08
Date



William E. Murphie
Manager
Portsmouth/Paducah Project Office
U.S. Department of Energy

6/6/08
Date

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ACRONYMS

CFR	Code of Federal Regulations
Ci	curie
DOE	U.S. Department of Energy
EDE	effective dose equivalent
EPA	U.S. Environmental Protection Agency
HEPA	high efficiency particulate
MEI	maximally exposed individual
mrem	millirem
NESHAP	National Emission Standards for Hazardous Air Pollutants
NPDES	National Pollutant Discharge Elimination System
PORTS	Portsmouth Gaseous Diffusion Plant
USEC	United States Enrichment Corporation

EXECUTIVE SUMMARY

This report provides the information required by Title 40 of the Code of Federal Regulations (CFR) Part 61, National Emission Standards for Hazardous Air Pollutants (NESHAP), Subpart H, National Emission Standards for Emissions of Radionuclides Other Than Radon from Department of Energy (DOE) Facilities.

DOE is responsible for five unmonitored minor emission sources at the Portsmouth Gaseous Diffusion Plant (PORTS): the X-326 L-cage Glovebox, X-622 Groundwater Treatment Facility, X-623 Groundwater Treatment Facility, X-624 Groundwater Treatment Facility, and X-627 Groundwater Treatment Facility. The X-622, X-623, X-624, and X-627 Groundwater Treatment Facilities are included because these facilities treat groundwater that is contaminated with radionuclides and are potential sources of radionuclide emissions. The United States Enrichment Corporation (USEC) is responsible for additional sources associated with the former gaseous diffusion process, the centrifuge enrichment technology (the Lead Cascade Test Facility), and other operations.

Radionuclide emissions from the DOE sources are modeled by the CAP88-PC Version 3.0 computer program [approved by the U.S. Environmental Protection Agency (EPA)] to determine the dose to members of the public at their home, school, or workplace (receptor location) around the PORTS facility. Emissions from the X-326 L-cage Glovebox and the X-622, X-623, X-624, and X-627 Groundwater Treatment Facilities were used to determine the dose for 2007.

In order to properly determine compliance with 40 CFR 61.92, the effective dose equivalents (EDEs) to individuals based on USEC emissions should be combined with the DOE PORTS EDEs. In 2007, the maximum EDE for USEC was 0.0034 millirem (mrem)/year, as provided to DOE by USEC. DOE is certifying the EDE for DOE activities only. DOE is not certifying the accuracy of the USEC data, calculations, or results. DOE understands that the USEC PORTS NESHAP report will be provided to U.S. EPA by USEC and will be certified by USEC.

To determine compliance with NESHAP regulations, the DOE PORTS EDE is combined with the USEC EDE to determine a total EDE from the PORTS facility for each receptor location. The highest combined EDE value is the maximum EDE to the maximally exposed individual (MEI) that is a member of the public. In 2007, the maximum combined EDE to the MEI was 0.0051 mrem/year (0.0017 mrem/year from DOE sources + 0.0034 mrem/year from USEC sources), which is well below the NESHAP standard of 10 mrem/year.

DOE collects samples from 15 ambient air monitoring stations on and around the PORTS reservation and analyzes them for the radionuclides that could be present in ambient air due to PORTS activities. These radionuclides are isotopic uranium (uranium-233/234, uranium-235, uranium-236, and uranium-238), technetium-99, and selected transuranic isotopes (americium-241, neptunium-237, plutonium-238, and plutonium-239/240). The ambient air monitoring stations measure radionuclides released from the DOE and USEC point sources, fugitive air emissions, and background concentrations of radionuclides.

The CAP88 model was used to generate a dose conversion factor that was used to calculate a dose (in mrem/year) for a given activity of each radionuclide in air (in picocuries per cubic meter). A dose was computed for each ambient air monitoring station. The net dose for each ambient air monitoring station (subtracting the dose measured at the background station) ranged from 0 (at stations with a gross dose less than the background station) to 0.000002 mrem/year. The highest net dose measured at the ambient air

monitoring stations is approximately 0.04% of the dose calculated from the combined DOE and USEC point source emissions (0.0051 mrem/year). These results indicate that fugitive emissions of radionuclides from the PORTS reservation do not cause a significant dose to individuals near the site and further demonstrate that emissions of radionuclides from PORTS are well within NESHAP limits.

1. FACILITY INFORMATION

1.1 SITE DESCRIPTION

The Portsmouth Gaseous Diffusion Plant (PORTS) began uranium enrichment operations in 1954. In 1993, the U.S. Department of Energy (DOE) leased the uranium enrichment production and operations facilities at PORTS to the United States Enrichment Corporation (USEC). USEC enriched uranium at PORTS for use in commercial nuclear power reactors until May 2001. At that time, USEC placed the production facilities at PORTS into a cold standby mode under a contract with DOE. DOE terminated the cold standby program as of September 30, 2005, and replaced it with the cold-shutdown program. USEC continues to lease and maintain the uranium enrichment facilities at PORTS.

USEC, Inc. (the parent company of USEC) is currently developing centrifuge enrichment technology at PORTS including construction of both a small scale demonstration facility (the Lead Cascade Test Facility) and a commercial scale uranium enrichment facility (the American Centrifuge Facility). Other current USEC operations at PORTS include 1) removal of deposited uranium compounds from enrichment cascade equipment; 2) removal of technetium-99 from contaminated uranium hexafluoride feed material; and 3) other operations to support ongoing and future missions.

This report covers only the DOE operations at PORTS. DOE, through its managing contractors, is responsible for the Environmental Restoration, Waste Management, and Uranium Programs at the plant, as well as maintaining nonleased DOE property. Additionally, a Depleted Uranium Hexafluoride Conversion Facility is being built for DOE at PORTS to process depleted uranium hexafluoride produced by the gaseous diffusion process. Depleted uranium hexafluoride, which is stored in cylinders, will be removed from the cylinders and converted to uranium oxide, which will be shipped off site. The facility is currently being constructed by Uranium Disposition Services LLC.

1.2 SOURCE DESCRIPTION

DOE PORTS has five unmonitored minor stack sources regulated by the U.S. Environmental Protection Agency (EPA) under the National Emission Standards for Hazardous Air Pollutants (NESHAP), Subpart H: the X-326 L-cage Glovebox, X-622 Groundwater Treatment Facility, X-623 Groundwater Treatment Facility, X-624 Groundwater Treatment Facility, and X-627 Groundwater Treatment Facility.

The X-326 L-cage Glovebox was used in 2007. The glovebox has airlocks for the entry and removal of work materials and is maintained under negative pressure during use. This negative pressure is produced by an exhaust fan drawing air through a high efficiency particulate (HEPA) filter. Effluent control is provided by the HEPA filter; calculations of emissions from the glovebox assume a HEPA filter control factor of 0.01 (99% efficiency) as provided in Title 40 of the Code of Federal Regulations (CFR), Part 61, Appendix D. Materials contaminated with radionuclides are sampled, batched, blended, or repackaged in the glovebox and generate low emissions of radionuclides.

The X-622, X-623, X-624, and X-627 Groundwater Treatment Facilities treat groundwater contaminated with volatile organic compounds and radionuclides and release the treated water through permitted DOE PORTS National Pollutant Discharge Elimination System (NPDES) outfalls. To reduce air emissions of volatile organic compounds from the groundwater treatment facilities, a de-mister is installed on the air stripper at X-622, and off-gas carbon units are installed on the air strippers at the X-623, X-624, and X-627 facilities. The clarifier at the X-622 Groundwater Treatment Facility is part of the treatment process and is vented to the environment. No control equipment is installed on the clarifier. No control equipment is installed at any of the groundwater treatment facilities to reduce emissions of radionuclides.

DOE understands that USEC will be submitting a separate NESHAP report addressing emissions of radionuclides from USEC operations.

2. RADIONUCLIDE EMISSIONS

Each of DOE's sources of radionuclide emissions are minor sources, defined as a release point or group of release points that has the potential to emit radionuclides that produce a dose of less than 0.1 millirem (mrem). Emissions from these minor sources are evaluated in accordance with Title 40 of the Code of Federal Regulations (CFR) Section 61.93 (b)(4)(i), which states: *For other release points which have a potential to release radionuclides into the air, periodic confirmatory measurements shall be made to confirm low emissions.*

Section 2.1 discusses the methods used to calculate radionuclide emissions from each of the DOE sources that emitted radionuclides during 2007. Table 1 presents a summary of the radionuclide emissions from DOE sources in 2007.

Table 1. Emissions (Ci/year) from DOE PORTS air emission sources in 2007

Radionuclide	X-622		X-623	X-624	X-627	X-326
	Air stripper	Clarifier				
Americium-241	9.3E-08	4.7E-08	5.5E-08	1.4E-08	2.4E-07	5.4E-13
Neptunium-237	3.9E-08	6.9E-09	6.7E-11	1.2E-08	5.1E-07	1.9E-12
Plutonium-238	4.1E-08	1.4E-08	2.8E-08	3.5E-08	1.3E-07	8.7E-13
Plutonium-239/240[a]	2.6E-08	7.1E-09	5.7E-08	0	7.6E-08	1.1E-12
Technetium-99	9.5E-07	9.0E-08	4.8E-04	9.9E-07	1.5E-07	2.2E-06
Uranium-233/234[a]	-	-	5.9E-05	1.6E-06	1.4E-06	
Uranium-234	2.8E-05[b]	1.9E-06[b]	-	-	-	2.6E-07
Uranium-235/236[a]	-	-	-	-	1.5E-07	
Uranium-235	6.3E-08[b]	4.2E-09[b]	6.5E-06	1.4E-07	-	1.2E-08
Uranium-236	-	-	4.5E-07	0	-	5.0E-10
Uranium-238	1.8E-07[b]	1.2E-08[b]	7.8E-06	3.0E-07	5.9E-07	2.7E-08
Total	2.9E-05	2.0E-06	5.6E-04	3.1E-06	3.2E-06	2.5E-06

[a]Plutonium-239/240 is entered as plutonium-239, uranium-233/234 is entered as uranium-234, and uranium-235/236 is entered as uranium-235 in the CAP88 model.

[b]Emissions of uranium isotopes from the X-622 Groundwater Treatment Facility are calculated based on the concentration of total uranium detected during emission testing of this facility.

Table 2 lists the distances from the DOE PORTS air emission sources to the nearest public receptors as required by 40 CFR Section 61.94(b)(6).

Table 2. Distances to nearest public receptors from DOE sources

Source	Distance in meters to the nearest:					
	Resident	School	Office/ Business	Farm		
				Crops/ Vegetables	Meat	Milk
X-326	1383 E	4999 NNW	1677 WNW	2185 WSW	1671 WSW	4498 N
X-622	3413 SE	5392 NNW	1293 SSE	2184 WSW	1495 SSE	4804 N
X-623	838 ESE	4264 NNW	2286 W	2800 SSE	1037 E	3505 NNW
X-624	579 ESE	4294 NNW	2652 W	2776 SSE	525 ESE	3353 NNW
X-627	4517 ESE	4118 NNW	5421 W	2654 W	1495 E	3439 N

2.1 UNMONITORED SOURCES

In 2007, emissions from the X-622 and X-627 Groundwater Treatment Facilities were calculated based on periodic air emissions testing. Emissions from each facility were estimated by calculating the number of operating hours during 2007 for each facility and assuming that the highest emissions rate recorded for each radionuclide during air emissions testing was emitted during each hour of operation. For radionuclides that were not detected, half the detection limit was used to calculate the emission rate.

Emissions from the X-623 and X-624 Groundwater Treatment Facilities were calculated based on influent and effluent sampling at each facility and annual throughput. The activity measured in the effluent sample was subtracted from the influent sample; the difference is assumed to have been emitted from the facility. As a conservative measure, radionuclides that were not detected in the samples were assumed to be present at half the detection limit.

Emissions from the X-326 Glovebox were based on the mass of the materials transferred within the glovebox, analytical data available on each material for radionuclides identified for air monitoring at PORTS (americium-241, neptunium-237, plutonium-238, plutonium-239/240, technetium-99, uranium-233/234, uranium-235, uranium-236, and uranium-238), and emission factors provided in 40 CFR Part 61 Appendix D.

2.2 FUGITIVE AND DIFFUSE SOURCES

Fugitive and diffuse emissions include all emissions that do not pass through a discrete stack, vent, or pipe. Potential emissions of diffuse and fugitive emissions at PORTS include normal building ventilation, soil and groundwater remediation sites, and wastewater treatment facilities.

Ambient air monitors are used at PORTS to confirm that radiological emissions from the site produce a dose much less than the level allowed by regulations. The ambient air monitors are divided

into three groups: on site, property line, and off site. One monitor is located 13 miles southwest of the facility to measure background levels of radionuclides.

Samples are collected on a weekly basis from the monitoring stations. Samples are then composited into a monthly sample and analyzed for radionuclides representative of PORTS operations. Analyses for transuranic radionuclides (americium-241, neptunium-237, plutonium-238, and plutonium-239/240) were changed from monthly to quarterly beginning in October 2007 based on the infrequent detections of these radionuclides. Analyses of technetium-99, uranium-233/234, uranium-235, uranium-236, and uranium-238 are performed monthly. Section 4.3, Table 6, provides a dose estimate for each ambient air monitoring station based on the results of this ambient air sampling.

An evaluation of fugitive and minor air emission sources was completed in 2000 to determine whether the ambient air monitors around PORTS were properly located in order to assure that the monitors would sample radiological emissions from these sources. Seven fugitive sources (both USEC and DOE) were evaluated: X-745B Cylinder Yard, X-745C Cylinder Yard, X-745E Cylinder Yard, X-745F Cylinder Yard, X-745G Cylinder Yard, X-747G Cylinder Yard, and X-747H Scrap Metal Disposal Project. Four DOE minor air emission sources (present as of 2000) were included in the evaluation: X-326 L-cage Glovebox, X-744G Glovebox, X-623 Groundwater Treatment Facility (air stripper), and X-624 Groundwater Treatment Facility (air stripper).

An air dispersion model [Industrial Source Complex - Third Release (ISC3)] was used to determine the direction of the maximum ambient air quality impact from the fugitive and minor air emission sources listed in the previous paragraph. The evaluation concluded that the existing monitoring network provides adequate surveillance of the evaluated emission sources, with the exception of the X-747H Scrap Metal Disposal Project. The report recommended placement of an air monitor north-northwest of this project; the monitor, Station T7, began operation in October 2000.

3. DOSE ASSESSMENT

3.1 DESCRIPTION OF DOSE MODEL

CAP88-PC Version 3.0, a computer program approved by EPA for compliance with 40 CFR Part 61 Subpart H, was used to calculate the dose from DOE PORTS radionuclide emissions to air. The program uses a modified Gaussian plume equation to estimate the dispersion of radionuclides. The program computes radionuclide concentrations in air, rates of deposition on ground surfaces, concentrations in food, and intake rates to people from ingestion of food produced in the assessment area.

3.2 SUMMARY OF INPUT PARAMETERS

Input parameters for the CAP88 model include physical parameters for each radionuclide emission source, radionuclide emissions, meteorological data, and agricultural data. Table 1 (Section 2.1) provides the radionuclide emissions for each source. Default values were used for the size and class of each radionuclide. Table 3 provides the physical parameters for each source.

Table 3. Physical parameters for DOE air emission sources

Parameter	X-326	X-622		X-623	X-624	X-627
		Air stripper	Clarifier			
Stack height (m)	22	8.1	8.1	7.6	6.1	6
Stack diameter (m)	0.36	0.2	0.1	0.2	0.2	0.2
Exit velocity (m/sec)	6.35	2.9	2.6	15.5	20.6	11

Site-specific meteorological data were used in the CAP88 model. The following data were collected for calendar year 2007:

Annual precipitation:	95 cm/year
Average air temperature:	12 °C
Average mixing layer height:	591 meters

Precipitation was measured by an automated gauge near the on-site meteorological tower, which is backed-up by an automated gauge at the North Holding Pond. Air temperature was measured at the on-site meteorological tower. The wind file used in the CAP88 model was generated from data collected at the 30-meter height from the on-site meteorological tower.

It should be noted that the default values provided with the CAP88-PC model can be very conservative. The rural food array used to estimate the DOE PORTS dose assumes that the public obtains all foodstuffs within 50 miles of the plant (see Table 4). In reality, the majority of the foodstuffs consumed locally are purchased at supermarkets that receive foodstuffs from all over the world.

Table 4. Agricultural data: rural default food array values

Fraction of foodstuffs from:	Local area	Within 50 mi	Beyond 50 mi
Vegetables and produce	0.700	0.300	0.000
Meat	0.442	0.558	0.000
Milk	0.399	0.601	0.000

3.3 RESULTS

The CAP88-PC model calculated the 2007 maximum effective dose equivalent (EDE) for the maximally exposed individual (MEI) near PORTS based on emissions from DOE PORTS sources to be 0.0018 mrem/year. This EDE includes dose contributions from all of the radionuclides listed in Table 1.

In order to properly determine compliance with 40 CFR 61.92, EDEs to individuals based on USEC emissions should be combined with the DOE PORTS EDEs. In 2007, the maximum EDE for USEC was 0.0034 mrem/year, as provided to DOE by USEC. DOE is not certifying the accuracy of the USEC data, calculations, or results. DOE understands that the USEC PORTS NESHAP report will be provided to U.S. EPA by USEC and will be certified by USEC.

To determine compliance with NESHAP regulations, the DOE PORTS effective dose equivalent (EDE) is combined with the USEC EDE to determine a total EDE from the PORTS facility for each receptor location. The highest combined EDE value is the maximum EDE to the MEI (see table below). In 2007, the maximum EDE to the MEI is 0.0051 mrem/year (0.0017 mrem/year from DOE sources + 0.0034 mrem/year from USEC sources), which is well below the NESHAP standard of 10 mrem/year.

Table 5. Summary of the EDE (mrem/year) to the DOE, USEC, and combined MEIs

	Location [distance (meters), direction, and DOE source]	EDE from DOE sources	EDE from USEC sources	Combined EDE
DOE MEI Location	2050 NE of X-622 914 E of X-623 579 ESE of X-624 1499 E of X-627 1995 ENE of X-326	0.0018	0.0028	0.0046
USEC MEI Location	2301 NE of X-622 1067 ENE of X-623 640 E of X-624 1634 E of X-627 2215 NE of X-326	0.0017	0.0034	0.0051
Maximum Combined MEI (DOE + USEC)	2301 NE of X-622 1067 ENE of X-623 640 E of X-624 1634 E of X-627 2215 NE of X-326	0.0017	0.0034	0.0051

4. ADDITIONAL INFORMATION

4.1 NEW/MODIFIED SOURCES

A Depleted Uranium Hexafluoride Conversion Facility is being built at PORTS to process depleted uranium hexafluoride produced by the gaseous diffusion process. Operations are anticipated to begin during 2009.

4.2 UNPLANNED RELEASES

There were no unplanned releases of radionuclides during 2007.

4.3 DOSE CALCULATIONS FOR EVALUATION OF DIFFUSE/FUGITIVE EMISSIONS

Ambient air monitoring stations (see Figure 1) measure radionuclides released from the DOE and USEC point sources (see Section 3), fugitive air emission sources such as those discussed in Section 2.2, and background concentrations of radionuclides. Samples are collected weekly from 15 stations and composited monthly. Analyses for transuranic radionuclides (americium-241, neptunium-237, plutonium-238, and plutonium-239/240) were changed from monthly to quarterly beginning in October 2007 based on the infrequent detections of these radionuclides. Analyses of technetium-99, uranium-233/234, uranium-235, uranium-236, and uranium-238 are performed monthly.

The CAP88 model is used to generate a dose conversion factor for each radionuclide. The dose conversion factor is used to compute a dose in mrem/year for a given activity of a radionuclide in air (in picocuries per cubic meter). For radionuclides that were detected in ambient air during 2007, the dose for that radionuclide is calculated by using the maximum concentration of each detected radionuclide. For radionuclides that were never detected, the dose is calculated by using half the detection limit to calculate the maximum concentration of the radionuclide in air. The doses attributable to each radionuclide are then added to obtain the gross dose for each station. The net dose is obtained by subtracting the dose at station A37, the background monitoring station (the net dose is recorded as zero for stations with a gross dose less than the background station).

Table 6 summarizes the total dose (both gross and net) for each station. The highest net dose for the ambient air monitoring stations was 0.000002 mrem/year at station A12, which is on the eastern PORTS boundary.

Table 6. Summary of doses (mrem/year) at ambient air monitoring stations

Station	Gross dose	Net dose	Station	Gross dose	Net dose
A3	1.4E-06	1.0E-07	A24	1.7E-06	4.0E-07
A6	1.1E-06	0	A28	1.1E-06	0
A8	1.3E-06	0	A29	9.0E-07	0
A9	1.9E-06	6.0E-07	A36	1.8E-06	5.0E-07
A10	1.0E-06	0	A37 (bkg)	1.3E-06	-
A12	3.3E-06	2.0E-06	A41	1.2E-06	0
A15	1.3E-06	0	T7	1.2E-06	0
A23	2.0E-06	7.0E-07			

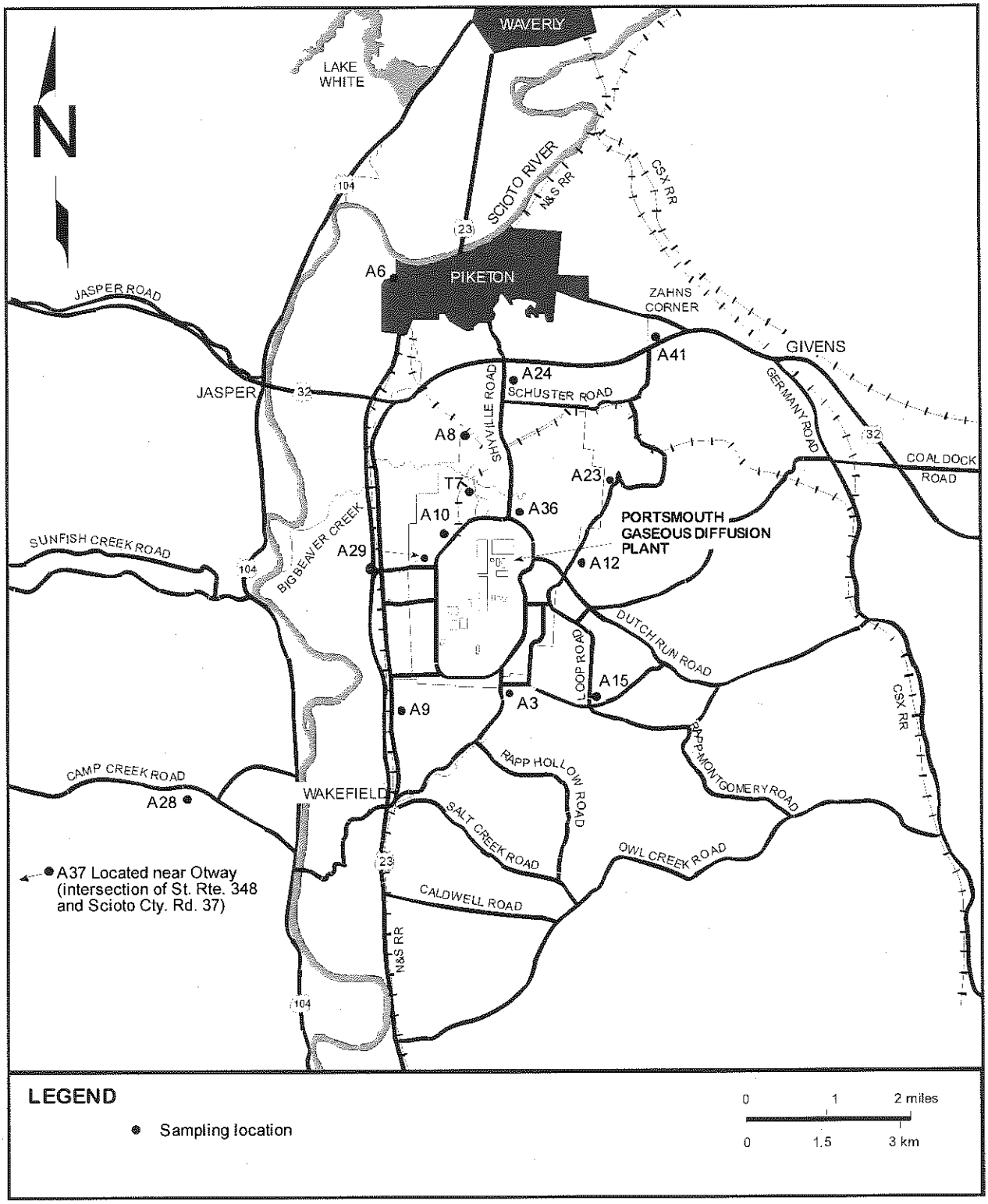

Figure 1. DOE PORTS ambient air monitoring stations.

The highest net dose measured at the ambient air monitoring stations (0.000002 mrem/year) is approximately 0.04% of the dose calculated from the combined DOE and USEC point source emissions (0.0051 mrem/year). These results indicate that fugitive and point source emissions of radionuclides from the PORTS reservation do not cause a significant dose to individuals near the site and further demonstrate that emissions of radionuclides from PORTS are well within NESHAP limits.

4.4 DOSE CALCULATIONS FOR SECURITY FENCE LINE LOCATIONS

Per request by U.S. EPA Region 5, a dose calculation using the CAP88 model was also completed for locations around the perimeter of the security fence of the PORTS process area. Emissions from the DOE PORTS radionuclide sources (the X-622, X-623, X-624, and X-627 Groundwater Treatment Facilities and the X-326 L-cage Glovebox) were used to determine the dose to a hypothetical person living at the security fence line at each of the 16 directional sectors around the plant (i.e., north, north-northeast, northeast, east-northeast, etc.). The maximum dose a hypothetical person living at the PORTS security fence line would receive from DOE PORTS radionuclide emissions is 0.0094 mrem/year at the east-northeast sector of the security fence line.

DOE/PPPO/03-0064&D1

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JUN 0 6 2008

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PPPO-03-173-08

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Dear Mr. Mathur and Mr. Reyer:

NATIONAL EMISSIONS STANDARDS FOR HAZARDOUS AIR POLLUTANTS, RADIONUCLIDE EMISSIONS REPORT FOR CALENDAR YEAR 2007

Enclosed is a certified copy of the annual Radiological National Emissions Standards for Hazardous Air Pollutants (NESHAP) report submitted in accordance with 40 CFR 61.94 (Subpart H) for airborne emissions from the U.S. Department of Energy (DOE) Portsmouth Gaseous Diffusion Plant (PORTS) during calendar year (CY) 2007.

During 2007, the PORTS site had operations conducted by two separate entities. The DOE, in conjunction with its remediation contractor, performed environmental restoration and waste management activities, while the United States Enrichment Corporation (USEC) leased and maintained the enrichment facilities at PORTS (both the former gaseous diffusion process, which is in "cold shutdown" status, and the centrifuge enrichment facility). The enclosed certified report addresses the emissions from the DOE operations only; however, for informational purposes, it also includes the total dose value associated with both DOE and USEC operations conducted at PORTS. The total dose value was derived by adding the DOE calculated dose with the dose value supplied to DOE by USEC. USEC will be submitting a separate NESHAP report addressing the radionuclide emissions from USEC operations. The combined dose to the most exposed individual resulting from both DOE and USEC operations was conservatively calculated at 0.0051 millirem (mrem) for CY 2007, which is below the regulatory standard of 10 mrem per year.

If you have any questions, please contact Melda Rafferty of my staff at (740) 897-5521.

Sincerely,

William E. Murphie
Manager
Portsmouth/Paducah Project Office

Enclosure:
Radiological National Emissions Standards for Hazardous Air Pollutants

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DOE/PPPO/03-0064&D1

Radiological National Emission Standards for Hazardous Air Pollutants (NESHAP) 2007 Annual Report for the Department of Energy Portsmouth Gaseous Diffusion Plant, Piketon, Ohio

This document is approved for public release
per review by:
Henry H. Thomas 5/21/08
PORTS Classification/Information Office Date

DOE/PPPO/03-0064&D1

Radiological National Emission Standards for Hazardous Air Pollutants (NESHAP) 2007 Annual Report for the Department of Energy Portsmouth Gaseous Diffusion Plant, Piketon, Ohio

Date Issued—June 2008

Prepared by
CDM, a Joint Venture
under subcontract LPP 05SC003
Document Control No.: 1205-01.01.05.16.01-02336

Prepared for the
U.S. Department of Energy
Portsmouth/Paducah Project Office

LATA/PARALLAX PORTSMOUTH, LLC
managing the
Environmental Remediation Activities at the
Portsmouth Gaseous Diffusion Plant
under contract DE-AC24-05OH20192
for the
U.S. DEPARTMENT OF ENERGY

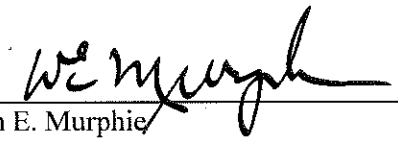
This certification pertains to the U.S. Department of Energy (DOE) activities at the Portsmouth site. It is DOE's understanding that the United States Enrichment Corporation (USEC) will be submitting a separate Radiological National Emission Standards for Hazardous Air Pollutants (NESHAP) 2007 Annual Report and certification pertaining to its activities at the Portsmouth site.

CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein and based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment. See, 18 U.S.C. 1001.

Paul Kreitz
Project Manager
LATA/Parallax Portsmouth, LLC (Operator)

5/29/08
Date



William E. Murphie
Manager
Portsmouth/Paducah Project Office
U.S. Department of Energy

6/6/08
Date

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ACRONYMS

CFR	Code of Federal Regulations
Ci	curie
DOE	U.S. Department of Energy
EDE	effective dose equivalent
EPA	U.S. Environmental Protection Agency
HEPA	high efficiency particulate
MEI	maximally exposed individual
mrem	millirem
NESHAP	National Emission Standards for Hazardous Air Pollutants
NPDES	National Pollutant Discharge Elimination System
PORTS	Portsmouth Gaseous Diffusion Plant
USEC	United States Enrichment Corporation

EXECUTIVE SUMMARY

This report provides the information required by Title 40 of the Code of Federal Regulations (CFR) Part 61, National Emission Standards for Hazardous Air Pollutants (NESHAP), Subpart H, National Emission Standards for Emissions of Radionuclides Other Than Radon from Department of Energy (DOE) Facilities.

DOE is responsible for five unmonitored minor emission sources at the Portsmouth Gaseous Diffusion Plant (PORTS): the X-326 L-cage Glovebox, X-622 Groundwater Treatment Facility, X-623 Groundwater Treatment Facility, X-624 Groundwater Treatment Facility, and X-627 Groundwater Treatment Facility. The X-622, X-623, X-624, and X-627 Groundwater Treatment Facilities are included because these facilities treat groundwater that is contaminated with radionuclides and are potential sources of radionuclide emissions. The United States Enrichment Corporation (USEC) is responsible for additional sources associated with the former gaseous diffusion process, the centrifuge enrichment technology (the Lead Cascade Test Facility), and other operations.

Radionuclide emissions from the DOE sources are modeled by the CAP88-PC Version 3.0 computer program [approved by the U.S. Environmental Protection Agency (EPA)] to determine the dose to members of the public at their home, school, or workplace (receptor location) around the PORTS facility. Emissions from the X-326 L-cage Glovebox and the X-622, X-623, X-624, and X-627 Groundwater Treatment Facilities were used to determine the dose for 2007.

In order to properly determine compliance with 40 CFR 61.92, the effective dose equivalents (EDEs) to individuals based on USEC emissions should be combined with the DOE PORTS EDEs. In 2007, the maximum EDE for USEC was 0.0034 millirem (mrem)/year, as provided to DOE by USEC. DOE is certifying the EDE for DOE activities only. DOE is not certifying the accuracy of the USEC data, calculations, or results. DOE understands that the USEC PORTS NESHAP report will be provided to U.S. EPA by USEC and will be certified by USEC.

To determine compliance with NESHAP regulations, the DOE PORTS EDE is combined with the USEC EDE to determine a total EDE from the PORTS facility for each receptor location. The highest combined EDE value is the maximum EDE to the maximally exposed individual (MEI) that is a member of the public. In 2007, the maximum combined EDE to the MEI was 0.0051 mrem/year (0.0017 mrem/year from DOE sources + 0.0034 mrem/year from USEC sources), which is well below the NESHAP standard of 10 mrem/year.

DOE collects samples from 15 ambient air monitoring stations on and around the PORTS reservation and analyzes them for the radionuclides that could be present in ambient air due to PORTS activities. These radionuclides are isotopic uranium (uranium-233/234, uranium-235, uranium-236, and uranium-238), technetium-99, and selected transuranic isotopes (americium-241, neptunium-237, plutonium-238, and plutonium-239/240). The ambient air monitoring stations measure radionuclides released from the DOE and USEC point sources, fugitive air emissions, and background concentrations of radionuclides.

The CAP88 model was used to generate a dose conversion factor that was used to calculate a dose (in mrem/year) for a given activity of each radionuclide in air (in picocuries per cubic meter). A dose was computed for each ambient air monitoring station. The net dose for each ambient air monitoring station (subtracting the dose measured at the background station) ranged from 0 (at stations with a gross dose less than the background station) to 0.000002 mrem/year. The highest net dose measured at the ambient air

monitoring stations is approximately 0.04% of the dose calculated from the combined DOE and USEC point source emissions (0.0051 mrem/year). These results indicate that fugitive emissions of radionuclides from the PORTS reservation do not cause a significant dose to individuals near the site and further demonstrate that emissions of radionuclides from PORTS are well within NESHAP limits.

1. FACILITY INFORMATION

1.1 SITE DESCRIPTION

The Portsmouth Gaseous Diffusion Plant (PORTS) began uranium enrichment operations in 1954. In 1993, the U.S. Department of Energy (DOE) leased the uranium enrichment production and operations facilities at PORTS to the United States Enrichment Corporation (USEC). USEC enriched uranium at PORTS for use in commercial nuclear power reactors until May 2001. At that time, USEC placed the production facilities at PORTS into a cold standby mode under a contract with DOE. DOE terminated the cold standby program as of September 30, 2005, and replaced it with the cold-shutdown program. USEC continues to lease and maintain the uranium enrichment facilities at PORTS.

USEC, Inc. (the parent company of USEC) is currently developing centrifuge enrichment technology at PORTS including construction of both a small scale demonstration facility (the Lead Cascade Test Facility) and a commercial scale uranium enrichment facility (the American Centrifuge Facility). Other current USEC operations at PORTS include 1) removal of deposited uranium compounds from enrichment cascade equipment; 2) removal of technetium-99 from contaminated uranium hexafluoride feed material; and 3) other operations to support ongoing and future missions.

This report covers only the DOE operations at PORTS. DOE, through its managing contractors, is responsible for the Environmental Restoration, Waste Management, and Uranium Programs at the plant, as well as maintaining nonleased DOE property. Additionally, a Depleted Uranium Hexafluoride Conversion Facility is being built for DOE at PORTS to process depleted uranium hexafluoride produced by the gaseous diffusion process. Depleted uranium hexafluoride, which is stored in cylinders, will be removed from the cylinders and converted to uranium oxide, which will be shipped off site. The facility is currently being constructed by Uranium Disposition Services LLC.

1.2 SOURCE DESCRIPTION

DOE PORTS has five unmonitored minor stack sources regulated by the U.S. Environmental Protection Agency (EPA) under the National Emission Standards for Hazardous Air Pollutants (NESHAP), Subpart H: the X-326 L-cage Glovebox, X-622 Groundwater Treatment Facility, X-623 Groundwater Treatment Facility, X-624 Groundwater Treatment Facility, and X-627 Groundwater Treatment Facility.

The X-326 L-cage Glovebox was used in 2007. The glovebox has airlocks for the entry and removal of work materials and is maintained under negative pressure during use. This negative pressure is produced by an exhaust fan drawing air through a high efficiency particulate (HEPA) filter. Effluent control is provided by the HEPA filter; calculations of emissions from the glovebox assume a HEPA filter control factor of 0.01 (99% efficiency) as provided in Title 40 of the Code of Federal Regulations (CFR), Part 61, Appendix D. Materials contaminated with radionuclides are sampled, batched, blended, or repackaged in the glovebox and generate low emissions of radionuclides.

The X-622, X-623, X-624, and X-627 Groundwater Treatment Facilities treat groundwater contaminated with volatile organic compounds and radionuclides and release the treated water through permitted DOE PORTS National Pollutant Discharge Elimination System (NPDES) outfalls. To reduce air emissions of volatile organic compounds from the groundwater treatment facilities, a de-mister is installed on the air stripper at X-622, and off-gas carbon units are installed on the air strippers at the X-623, X-624, and X-627 facilities. The clarifier at the X-622 Groundwater Treatment Facility is part of the treatment process and is vented to the environment. No control equipment is installed on the clarifier. No control equipment is installed at any of the groundwater treatment facilities to reduce emissions of radionuclides.

DOE understands that USEC will be submitting a separate NESHAP report addressing emissions of radionuclides from USEC operations.

2. RADIONUCLIDE EMISSIONS

Each of DOE's sources of radionuclide emissions are minor sources, defined as a release point or group of release points that has the potential to emit radionuclides that produce a dose of less than 0.1 millirem (mrem). Emissions from these minor sources are evaluated in accordance with Title 40 of the Code of Federal Regulations (CFR) Section 61.93 (b)(4)(i), which states: *For other release points which have a potential to release radionuclides into the air, periodic confirmatory measurements shall be made to confirm low emissions.*

Section 2.1 discusses the methods used to calculate radionuclide emissions from each of the DOE sources that emitted radionuclides during 2007. Table 1 presents a summary of the radionuclide emissions from DOE sources in 2007.

Table 1. Emissions (Ci/year) from DOE PORTS air emission sources in 2007

Radionuclide	X-622		X-623	X-624	X-627	X-326
	Air stripper	Clarifier				
Americium-241	9.3E-08	4.7E-08	5.5E-08	1.4E-08	2.4E-07	5.4E-13
Neptunium-237	3.9E-08	6.9E-09	6.7E-11	1.2E-08	5.1E-07	1.9E-12
Plutonium-238	4.1E-08	1.4E-08	2.8E-08	3.5E-08	1.3E-07	8.7E-13
Plutonium-239/240[a]	2.6E-08	7.1E-09	5.7E-08	0	7.6E-08	1.1E-12
Technetium-99	9.5E-07	9.0E-08	4.8E-04	9.9E-07	1.5E-07	2.2E-06
Uranium-233/234[a]	-	-	5.9E-05	1.6E-06	1.4E-06	
Uranium-234	2.8E-05[b]	1.9E-06[b]	-	-	-	2.6E-07
Uranium-235/236[a]	-	-	-	-	1.5E-07	
Uranium-235	6.3E-08[b]	4.2E-09[b]	6.5E-06	1.4E-07	-	1.2E-08
Uranium-236	-	-	4.5E-07	0	-	5.0E-10
Uranium-238	1.8E-07[b]	1.2E-08[b]	7.8E-06	3.0E-07	5.9E-07	2.7E-08
Total	2.9E-05	2.0E-06	5.6E-04	3.1E-06	3.2E-06	2.5E-06

[a]Plutonium-239/240 is entered as plutonium-239, uranium-233/234 is entered as uranium-234, and uranium-235/236 is entered as uranium-235 in the CAP88 model.

[b]Emissions of uranium isotopes from the X-622 Groundwater Treatment Facility are calculated based on the concentration of total uranium detected during emission testing of this facility.

Table 2 lists the distances from the DOE PORTS air emission sources to the nearest public receptors as required by 40 CFR Section 61.94(b)(6).

Table 2. Distances to nearest public receptors from DOE sources

Source	Distance in meters to the nearest:					
	Resident	School	Office/ Business	Farm		
				Crops/ Vegetables	Meat	Milk
X-326	1383 E	4999 NNW	1677 WNW	2185 WSW	1671 WSW	4498 N
X-622	3413 SE	5392 NNW	1293 SSE	2184 WSW	1495 SSE	4804 N
X-623	838 ESE	4264 NNW	2286 W	2800 SSE	1037 E	3505 NNW
X-624	579 ESE	4294 NNW	2652 W	2776 SSE	525 ESE	3353 NNW
X-627	4517 ESE	4118 NNW	5421 W	2654 W	1495 E	3439 N

2.1 UNMONITORED SOURCES

In 2007, emissions from the X-622 and X-627 Groundwater Treatment Facilities were calculated based on periodic air emissions testing. Emissions from each facility were estimated by calculating the number of operating hours during 2007 for each facility and assuming that the highest emissions rate recorded for each radionuclide during air emissions testing was emitted during each hour of operation. For radionuclides that were not detected, half the detection limit was used to calculate the emission rate.

Emissions from the X-623 and X-624 Groundwater Treatment Facilities were calculated based on influent and effluent sampling at each facility and annual throughput. The activity measured in the effluent sample was subtracted from the influent sample; the difference is assumed to have been emitted from the facility. As a conservative measure, radionuclides that were not detected in the samples were assumed to be present at half the detection limit.

Emissions from the X-326 Glovebox were based on the mass of the materials transferred within the glovebox, analytical data available on each material for radionuclides identified for air monitoring at PORTS (americium-241, neptunium-237, plutonium-238, plutonium-239/240, technetium-99, uranium-233/234, uranium-235, uranium-236, and uranium-238), and emission factors provided in 40 CFR Part 61 Appendix D.

2.2 FUGITIVE AND DIFFUSE SOURCES

Fugitive and diffuse emissions include all emissions that do not pass through a discrete stack, vent, or pipe. Potential emissions of diffuse and fugitive emissions at PORTS include normal building ventilation, soil and groundwater remediation sites, and wastewater treatment facilities.

Ambient air monitors are used at PORTS to confirm that radiological emissions from the site produce a dose much less than the level allowed by regulations. The ambient air monitors are divided

into three groups: on site, property line, and off site. One monitor is located 13 miles southwest of the facility to measure background levels of radionuclides.

Samples are collected on a weekly basis from the monitoring stations. Samples are then composited into a monthly sample and analyzed for radionuclides representative of PORTS operations. Analyses for transuranic radionuclides (americium-241, neptunium-237, plutonium-238, and plutonium-239/240) were changed from monthly to quarterly beginning in October 2007 based on the infrequent detections of these radionuclides. Analyses of technetium-99, uranium-233/234, uranium-235, uranium-236, and uranium-238 are performed monthly. Section 4.3, Table 6, provides a dose estimate for each ambient air monitoring station based on the results of this ambient air sampling.

An evaluation of fugitive and minor air emission sources was completed in 2000 to determine whether the ambient air monitors around PORTS were properly located in order to assure that the monitors would sample radiological emissions from these sources. Seven fugitive sources (both USEC and DOE) were evaluated: X-745B Cylinder Yard, X-745C Cylinder Yard, X-745E Cylinder Yard, X-745F Cylinder Yard, X-745G Cylinder Yard, X-747G Cylinder Yard, and X-747H Scrap Metal Disposal Project. Four DOE minor air emission sources (present as of 2000) were included in the evaluation: X-326 L-cage Glovebox, X-744G Glovebox, X-623 Groundwater Treatment Facility (air stripper), and X-624 Groundwater Treatment Facility (air stripper).

An air dispersion model [Industrial Source Complex - Third Release (ISC3)] was used to determine the direction of the maximum ambient air quality impact from the fugitive and minor air emission sources listed in the previous paragraph. The evaluation concluded that the existing monitoring network provides adequate surveillance of the evaluated emission sources, with the exception of the X-747H Scrap Metal Disposal Project. The report recommended placement of an air monitor north-northwest of this project; the monitor, Station T7, began operation in October 2000.

3. DOSE ASSESSMENT

3.1 DESCRIPTION OF DOSE MODEL

CAP88-PC Version 3.0, a computer program approved by EPA for compliance with 40 CFR Part 61 Subpart H, was used to calculate the dose from DOE PORTS radionuclide emissions to air. The program uses a modified Gaussian plume equation to estimate the dispersion of radionuclides. The program computes radionuclide concentrations in air, rates of deposition on ground surfaces, concentrations in food, and intake rates to people from ingestion of food produced in the assessment area.

3.2 SUMMARY OF INPUT PARAMETERS

Input parameters for the CAP88 model include physical parameters for each radionuclide emission source, radionuclide emissions, meteorological data, and agricultural data. Table 1 (Section 2.1) provides the radionuclide emissions for each source. Default values were used for the size and class of each radionuclide. Table 3 provides the physical parameters for each source.

Table 3. Physical parameters for DOE air emission sources

Parameter	X-326	X-622		X-623	X-624	X-627
		Air stripper	Clarifier			
Stack height (m)	22	8.1	8.1	7.6	6.1	6
Stack diameter (m)	0.36	0.2	0.1	0.2	0.2	0.2
Exit velocity (m/sec)	6.35	2.9	2.6	15.5	20.6	11

Site-specific meteorological data were used in the CAP88 model. The following data were collected for calendar year 2007:

Annual precipitation:	95 cm/year
Average air temperature:	12 °C
Average mixing layer height:	591 meters

Precipitation was measured by an automated gauge near the on-site meteorological tower, which is backed-up by an automated gauge at the North Holding Pond. Air temperature was measured at the on-site meteorological tower. The wind file used in the CAP88 model was generated from data collected at the 30-meter height from the on-site meteorological tower.

It should be noted that the default values provided with the CAP88-PC model can be very conservative. The rural food array used to estimate the DOE PORTS dose assumes that the public obtains all foodstuffs within 50 miles of the plant (see Table 4). In reality, the majority of the foodstuffs consumed locally are purchased at supermarkets that receive foodstuffs from all over the world.

Table 4. Agricultural data: rural default food array values

Fraction of foodstuffs from:	Local area	Within 50 mi	Beyond 50 mi
Vegetables and produce	0.700	0.300	0.000
Meat	0.442	0.558	0.000
Milk	0.399	0.601	0.000

3.3 RESULTS

The CAP88-PC model calculated the 2007 maximum effective dose equivalent (EDE) for the maximally exposed individual (MEI) near PORTS based on emissions from DOE PORTS sources to be 0.0018 mrem/year. This EDE includes dose contributions from all of the radionuclides listed in Table 1.

In order to properly determine compliance with 40 CFR 61.92, EDEs to individuals based on USEC emissions should be combined with the DOE PORTS EDEs. In 2007, the maximum EDE for USEC was 0.0034 mrem/year, as provided to DOE by USEC. DOE is not certifying the accuracy of the USEC data, calculations, or results. DOE understands that the USEC PORTS NESHAP report will be provided to U.S. EPA by USEC and will be certified by USEC.

To determine compliance with NESHAP regulations, the DOE PORTS effective dose equivalent (EDE) is combined with the USEC EDE to determine a total EDE from the PORTS facility for each receptor location. The highest combined EDE value is the maximum EDE to the MEI (see table below). In 2007, the maximum EDE to the MEI is 0.0051 mrem/year (0.0017 mrem/year from DOE sources + 0.0034 mrem/year from USEC sources), which is well below the NESHAP standard of 10 mrem/year.

Table 5. Summary of the EDE (mrem/year) to the DOE, USEC, and combined MEIs

	Location [distance (meters), direction, and DOE source]	EDE from DOE sources	EDE from USEC sources	Combined EDE
DOE MEI Location	2050 NE of X-622 914 E of X-623 579 ESE of X-624 1499 E of X-627 1995 ENE of X-326	0.0018	0.0028	0.0046
USEC MEI Location	2301 NE of X-622 1067 ENE of X-623 640 E of X-624 1634 E of X-627 2215 NE of X-326	0.0017	0.0034	0.0051
Maximum Combined MEI (DOE + USEC)	2301 NE of X-622 1067 ENE of X-623 640 E of X-624 1634 E of X-627 2215 NE of X-326	0.0017	0.0034	0.0051

4. ADDITIONAL INFORMATION

4.1 NEW/MODIFIED SOURCES

A Depleted Uranium Hexafluoride Conversion Facility is being built at PORTS to process depleted uranium hexafluoride produced by the gaseous diffusion process. Operations are anticipated to begin during 2009.

4.2 UNPLANNED RELEASES

There were no unplanned releases of radionuclides during 2007.

4.3 DOSE CALCULATIONS FOR EVALUATION OF DIFFUSE/FUGITIVE EMISSIONS

Ambient air monitoring stations (see Figure 1) measure radionuclides released from the DOE and USEC point sources (see Section 3), fugitive air emission sources such as those discussed in Section 2.2, and background concentrations of radionuclides. Samples are collected weekly from 15 stations and composited monthly. Analyses for transuranic radionuclides (americium-241, neptunium-237, plutonium-238, and plutonium-239/240) were changed from monthly to quarterly beginning in October 2007 based on the infrequent detections of these radionuclides. Analyses of technetium-99, uranium-233/234, uranium-235, uranium-236, and uranium-238 are performed monthly.

The CAP88 model is used to generate a dose conversion factor for each radionuclide. The dose conversion factor is used to compute a dose in mrem/year for a given activity of a radionuclide in air (in picocuries per cubic meter). For radionuclides that were detected in ambient air during 2007, the dose for that radionuclide is calculated by using the maximum concentration of each detected radionuclide. For radionuclides that were never detected, the dose is calculated by using half the detection limit to calculate the maximum concentration of the radionuclide in air. The doses attributable to each radionuclide are then added to obtain the gross dose for each station. The net dose is obtained by subtracting the dose at station A37, the background monitoring station (the net dose is recorded as zero for stations with a gross dose less than the background station).

Table 6 summarizes the total dose (both gross and net) for each station. The highest net dose for the ambient air monitoring stations was 0.000002 mrem/year at station A12, which is on the eastern PORTS boundary.

Table 6. Summary of doses (mrem/year) at ambient air monitoring stations

Station	Gross dose	Net dose	Station	Gross dose	Net dose
A3	1.4E-06	1.0E-07	A24	1.7E-06	4.0E-07
A6	1.1E-06	0	A28	1.1E-06	0
A8	1.3E-06	0	A29	9.0E-07	0
A9	1.9E-06	6.0E-07	A36	1.8E-06	5.0E-07
A10	1.0E-06	0	A37 (bkg)	1.3E-06	-
A12	3.3E-06	2.0E-06	A41	1.2E-06	0
A15	1.3E-06	0	T7	1.2E-06	0
A23	2.0E-06	7.0E-07			

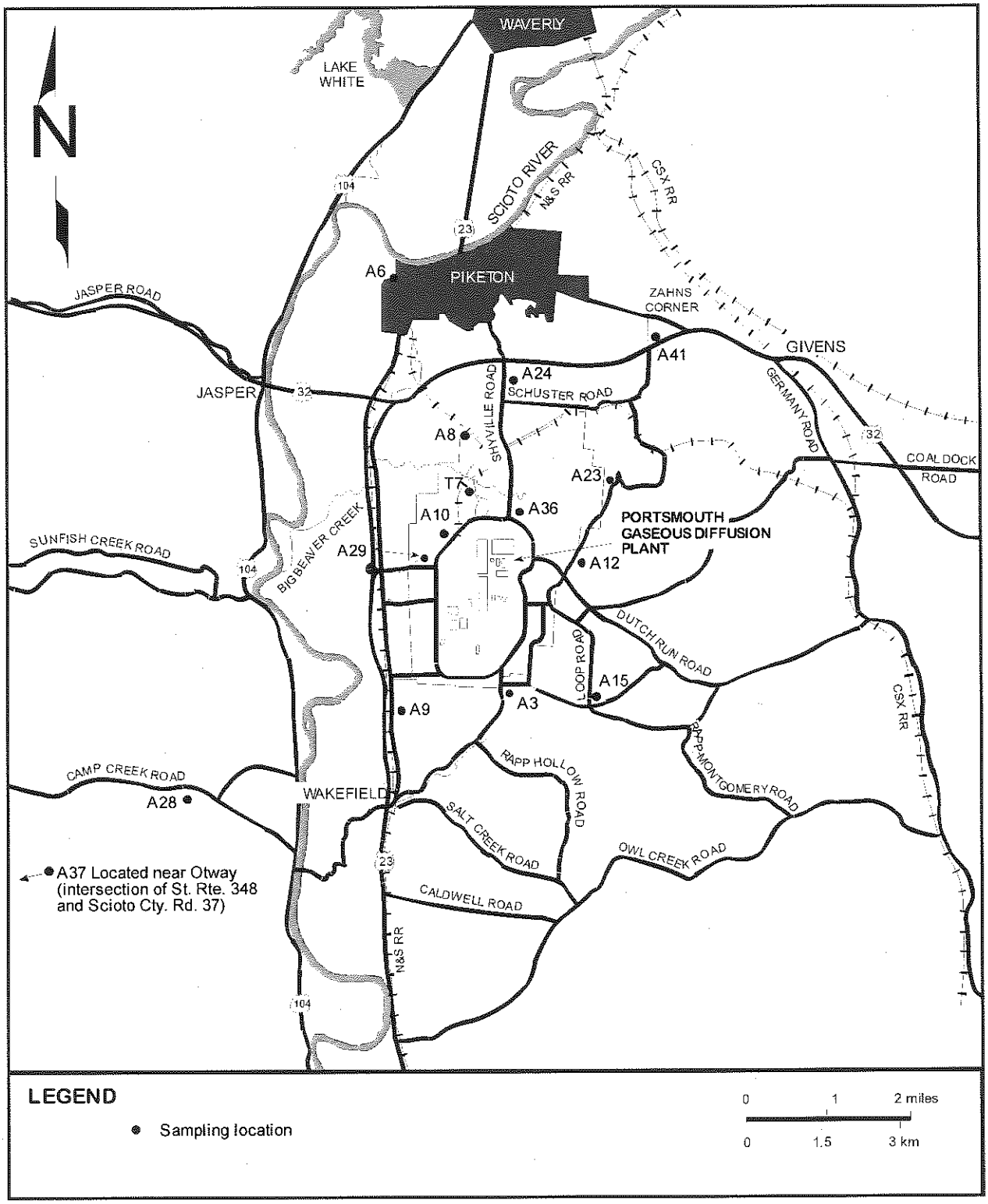

Figure 1. DOE PORTS ambient air monitoring stations.

The highest net dose measured at the ambient air monitoring stations (0.000002 mrem/year) is approximately 0.04% of the dose calculated from the combined DOE and USEC point source emissions (0.0051 mrem/year). These results indicate that fugitive and point source emissions of radionuclides from the PORTS reservation do not cause a significant dose to individuals near the site and further demonstrate that emissions of radionuclides from PORTS are well within NESHAP limits.

4.4 DOSE CALCULATIONS FOR SECURITY FENCE LINE LOCATIONS

Per request by U.S. EPA Region 5, a dose calculation using the CAP88 model was also completed for locations around the perimeter of the security fence of the PORTS process area. Emissions from the DOE PORTS radionuclide sources (the X-622, X-623, X-624, and X-627 Groundwater Treatment Facilities and the X-326 L-cage Glovebox) were used to determine the dose to a hypothetical person living at the security fence line at each of the 16 directional sectors around the plant (i.e., north, north-northeast, northeast, east-northeast, etc.). The maximum dose a hypothetical person living at the PORTS security fence line would receive from DOE PORTS radionuclide emissions is 0.0094 mrem/year at the east-northeast sector of the security fence line.

DOE/PPPO/03-0064&D1

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